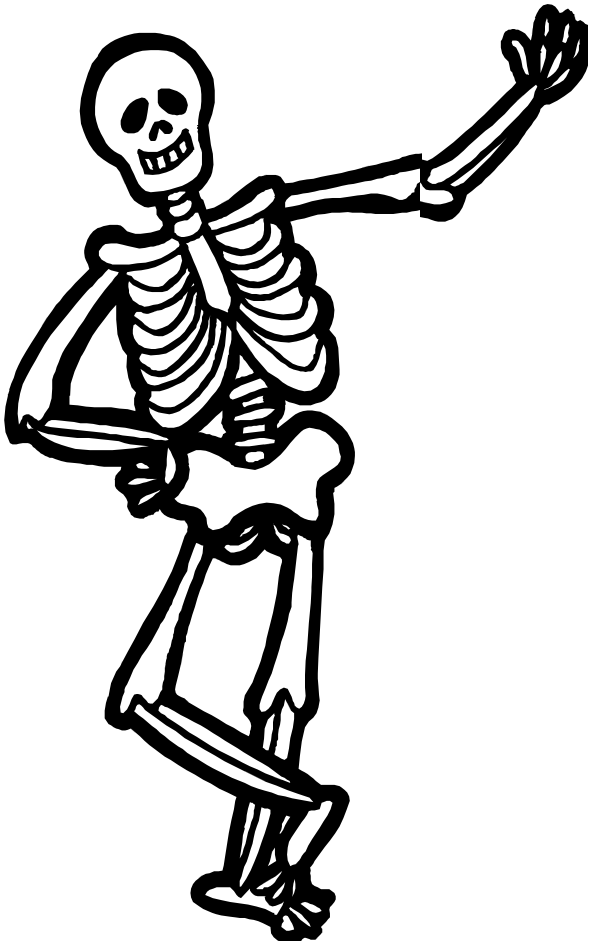
Keeping *Bone Healthy*
Let's Prevent Osteoporosis

Presenting …

Nutrition and Osteoporosis



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updated October 2012

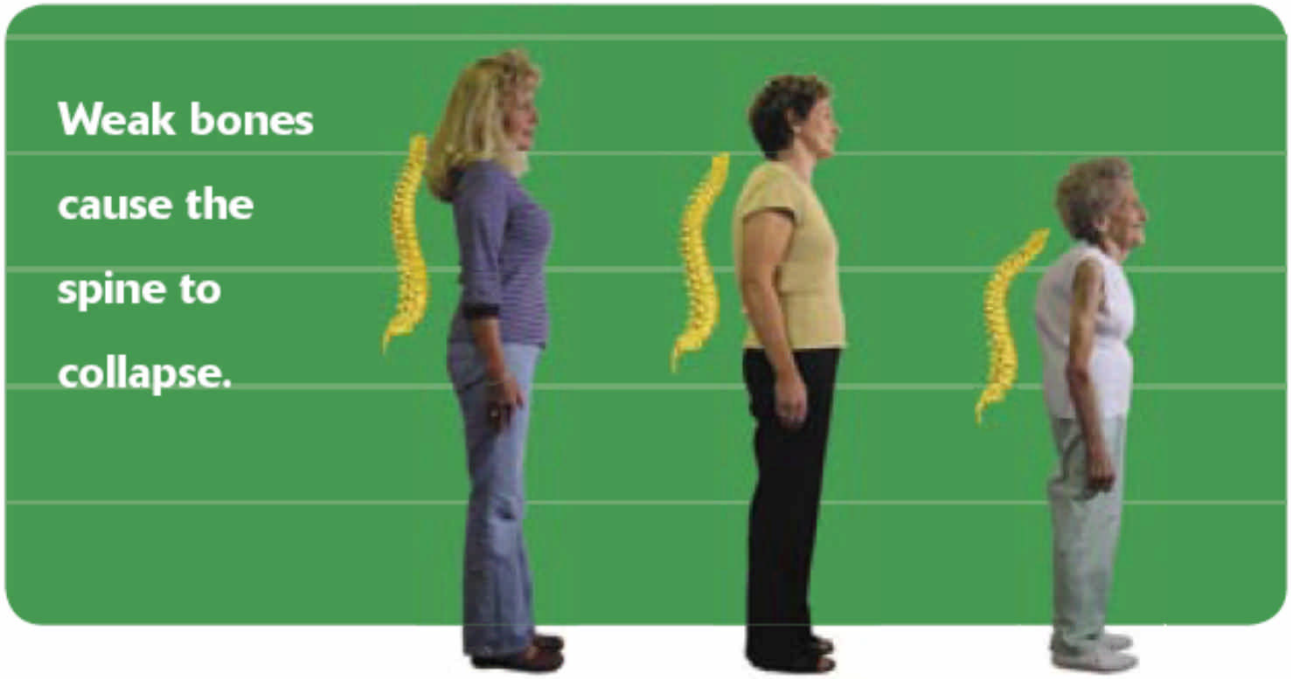
Disclaimer

The following information on nutritional aspects of osteoporosis is provided as information for general healthy eating. It should not be considered a substitute for seeking dietary advice from your own healthcare provider.

Calcium and Vitamin D recommendations are based on those developed for the United States and Canada. They may not be appropriate for all countries due to differing dietary patterns and environmental factors.

Typical comments from people with osteoporosis

"I've lost six inches in height and none of my clothes fit me anymore. Plus, it's hard to get clothes that look nice when my back is so hunched over."



Comments

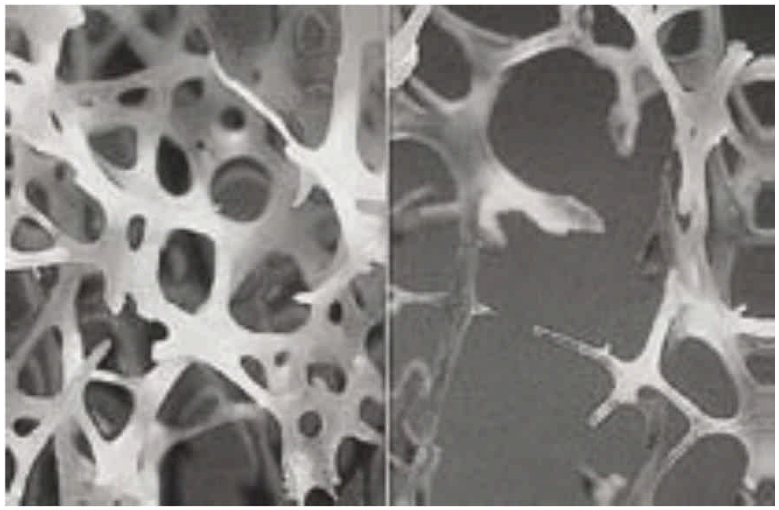
"If somebody had told me sooner what I know now about osteoporosis, none of this might be happening to me!"

Today's presentation . . .

- Overview of State Osteoporosis Program
- Risk factors
- Prevention steps
- Food and supplement labels
- Recommended calcium & vitamin D
- Percent Daily Value of calcium in common foods
- Additional dietary considerations
- Help for the lactose-intolerant
- If you don't like to "drink" milk
- Calcium supplements
- Putting it all together

Overview

Osteoporosis causes weak bones. In this common disease, bones lose minerals like calcium. They become fragile and break easily.



Normal Bone

Bone with Osteoporosis

Source: The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

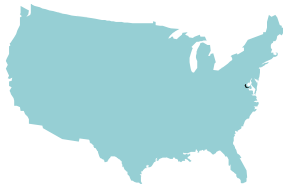
The Problem in America

- Major health threat for an estimated 44 million (55%) of people 50 years and older
- 10 million estimated to have osteoporosis
- 34 million have low bone mass placing them at risk
- 1 in 2 women and 1 in 4 men over 50 will have an osteoporosis-related fracture

Source: National Osteoporosis Foundation Web site; retrieved July 2005 at http://www.nof.org

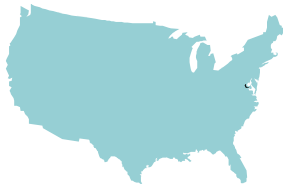
The Problem in Kentucky

- Of all Kentuckians aged 50 and older, 14% have osteoporosis, 77% of whom are women.
- Women age 50 and older, 20% have osteoporosis and 53% have low bone mass.



A woman's hip fracture risk equals her combined risk of breast, uterine and ovarian cancer.

Source: National Osteoporosis Foundation Web site; retrieved July 2005 at http://www.nof.org



Hip fractures account for 293,000 hospitalizations annually.

People who break a hip might not recover for months or even years.

2005

Source: National Osteoporosis Foundation http://nof.org/node/40

- Caring for bone fractures from Osteoporosis in 2005 costs America $19 billion.
- By 2025, experts predict that these cost will rise to approximately $25.3 billion.

Source: The 2005 NOFhttp://nof.org/node/40

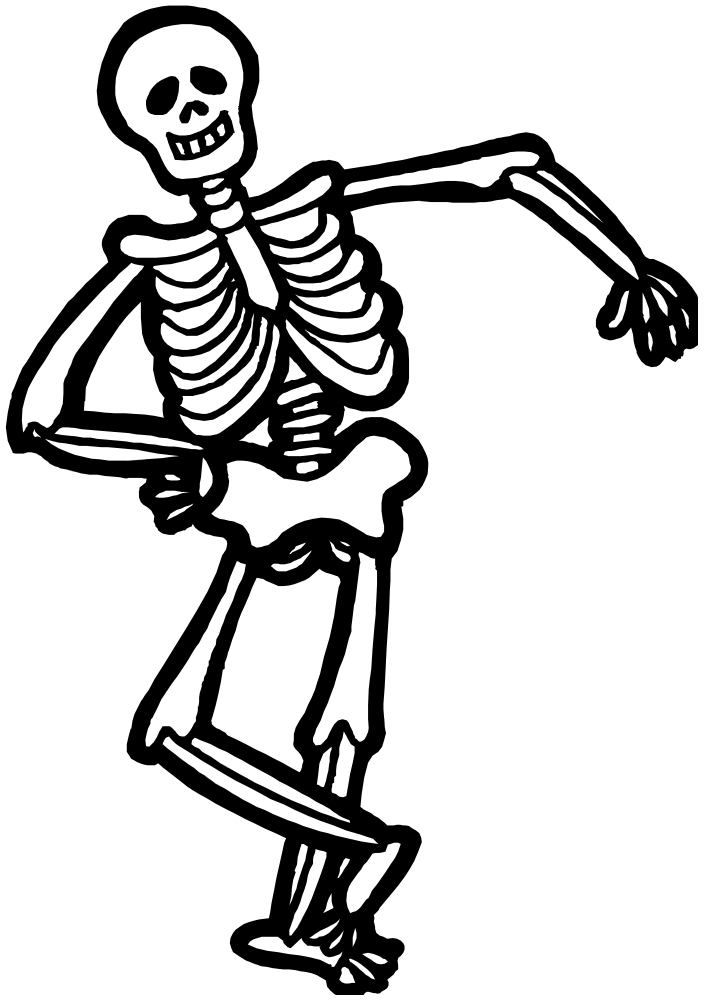
The “silent disease”

- Often called the “silent disease”
- Bone loss occurs without symptoms
  - First sign may be a fracture due to weakened bones
  - A sudden strain or bump can break a bone

The most common breaks in weak bones are in the wrist, spine and hip.

Source: The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

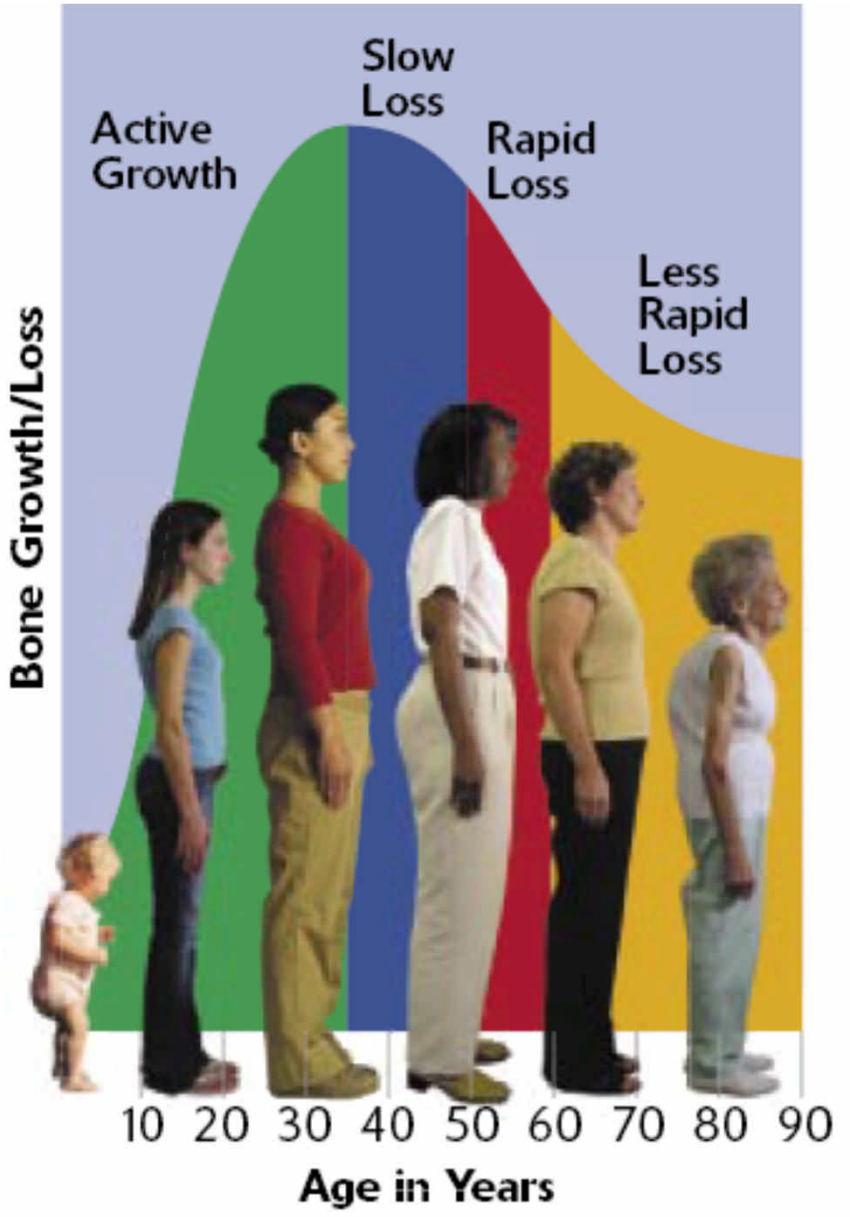
Bones are living organs



- Calcium is deposited and withdrawn from bones daily.
- Bones build to about age 30.
- We need to build up a healthy bone account while young and continue to make deposits with age.

- After mid-30's, you begin to slowly lose bone mass. Women lose bone mass faster after menopause, but it happens to men too.

- Bones can weaken early in life without a healthy diet and the right kinds of physical activity.

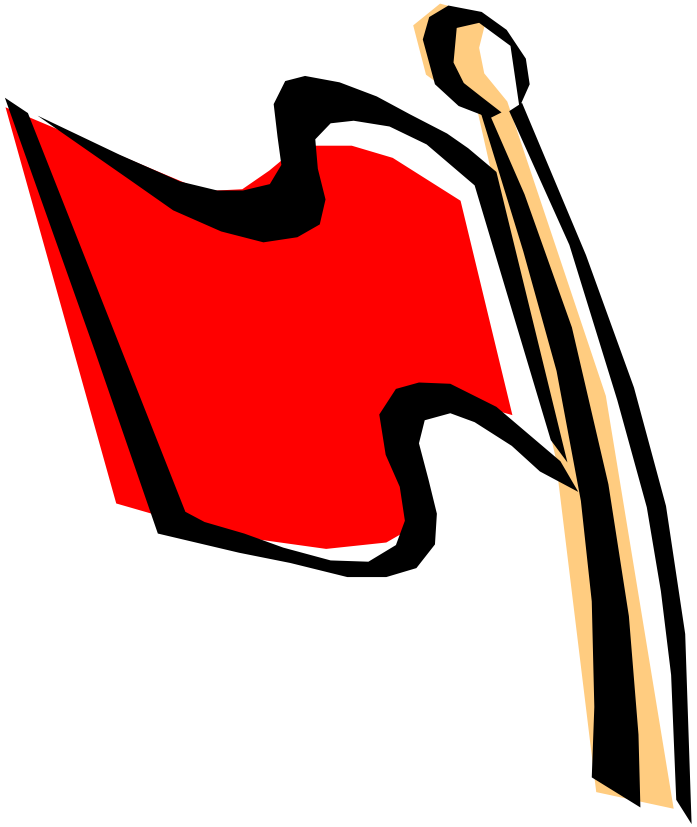


Source: The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

You’re never too young or old to improve bone health!

Risk factors

If you have any of these “red flags,” you could be at high risk for weak bones. Talk to your health care professional.



Source: The 2004 Surgeon General’s Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

- I'm older than 65
- I've broken a bone after age 50
- My close relative has osteoporosis or has broken a bone
- My health is "fair" or "poor"
- I smoke
- I am underweight for my height

- I started menopause before age 45
- I've never gotten enough calcium
- I have more than two drinks of alcohol several times a week
- I have poor vision, even with glasses
- I sometimes fall
- I'm not active

I have one of these medical conditions:

- ❑ Hyperthyroidism
- ❑ Chronic lung disease
- ❑ Cancer
- ❑ Inflammatory bowel disease
- ❑ Chronic liver or kidney disease
- ❑ Hyperparathyroidism
- ❑ Vitamin D deficiency
- ❑ Cushing's disease
- ❑ Multiple sclerosis
- ❑ Rheumatoid arthritis

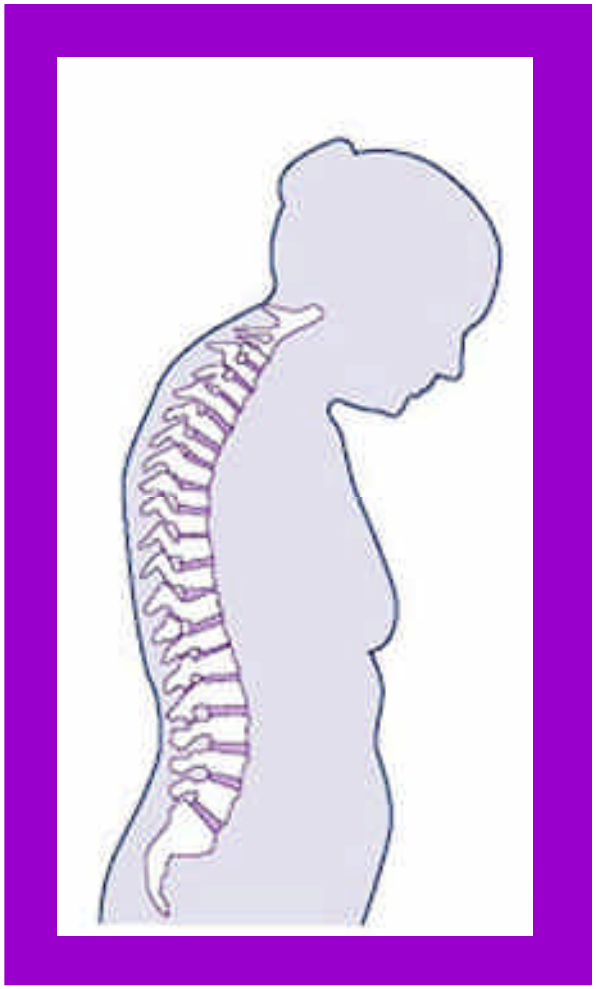
I take one of these medicines:

- ❑ Oral glucocorticoids (steroids)
- ❑ Cancer treatments (radiation, chemotherapy)
- ❑ Thyroid medicine
- ❑ Antiepileptic medications
- ❑ Gonadal hormone suppression
- ❑ Immunosuppressive agents

The good news: Osteoporosis is preventable for most people!

- Start building healthy bones while young.
- Healthy diet and lifestyle are important for BOTH men and women.

Simple Prevention Steps



The National Osteoporosis Foundation (NOF) recommends FIVE simple steps to bone health and osteoporosis prevention …

Step 1

Get your daily recommended amounts of calcium and vitamin D.

Use MyPyramid.gov to help plan an overall healthy diet

Step 2

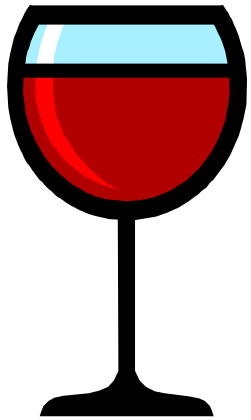
Engage in regular weight-bearing exercise.

Even simple activities such as walking, stair climbing and dancing can strengthen bones.

Step 3

Avoid smoking and excessive alcohol.

12 oz.



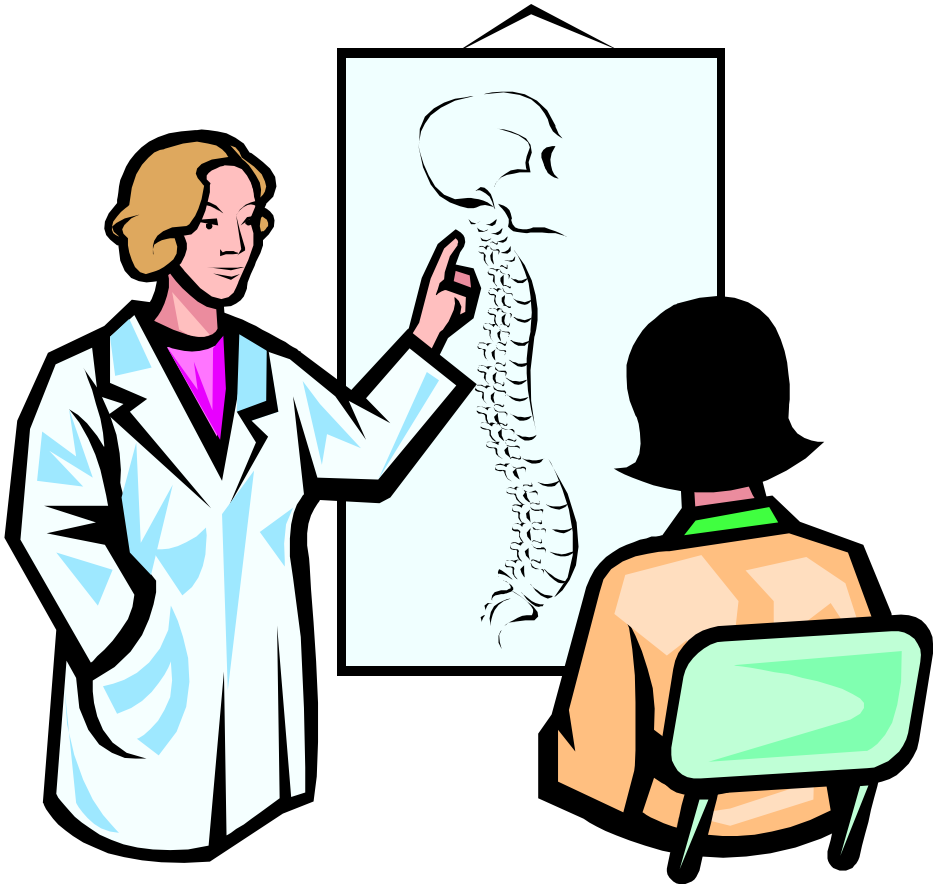
5 oz.

1.5 oz.

MyPyramid.gov recommends no more than 1 drink per day for women and 2 for men.

Step 4

Talk to your doctor about bone health.



Step 5

Have a bone density test and take medication when appropriate.

Source of photo: USDA ARS Photo Unit Photo by Peggy Greb

Testing is a simple, painless procedure.

Nutrition labels & calcium

- FDA uses “Percent Daily Value” (% DV) to describe amount of calcium needed by general U.S. population daily

- **100% DV for calcium = 1,000 mg**

- Look for this label:
  - “Nutrition Facts” on foods
  - “Supplement Facts” on vitamin/mineral supplements

Sample "Nutrition Facts" label

FROZEN CHOPPED BROCCOLI

Nutrition Facts

Serving Size 1/2 cup (93g)
Servings Per Container 4

Amount Per Serving		
Calories 25	**Calories from Fat** 0	
		% Daily Value*
Total Fat 0g		0%
Saturated Fat 0g		0%
Cholesterol 0mg		0%
Sodium 20Mg		1%
Total Carbohydrate 5g		2%
Dietary Fiber 3g		12%
Sugars 2g		
Protein 3g		
Vitamin A 35%	• Vitamin C	60%
Calcium 4%	• Iron	4%

*Percent Daily Values are based on a 2,000 calorie diet.

Nutrition Facts

Serving Size 1 cup (236mL)
Servings Per Container 8

Amount Per Serving		
Calories 90	**Calories from Fat** 0	
		% Daily Value*
Total Fat 0g		0%
Saturated Fat 0g		0%
Cholesterol 5mg		2%
Sodium 125 mg		5%
Total Carbohydrate 13g		4%
Dietary Fiber 0g		0%
Sugars 12 g		
Protein 8g		
Vitamin A 10%	• Vitamin C	4%
Calcium 30%	• Iron	0%
Vitamin D 25%		

*Percent Daily Values are based on a 2,000 calorie diet.

SKIM MILK

Example of “Daily Value”

If a food or supplement has 200 mg of calcium per serving, the “Nutrition Facts” or “Supplement Facts” panel shows:

20% DV for calcium
(200 mg ÷ 1,000 mg = 20%)

MACARONI & CHEESE

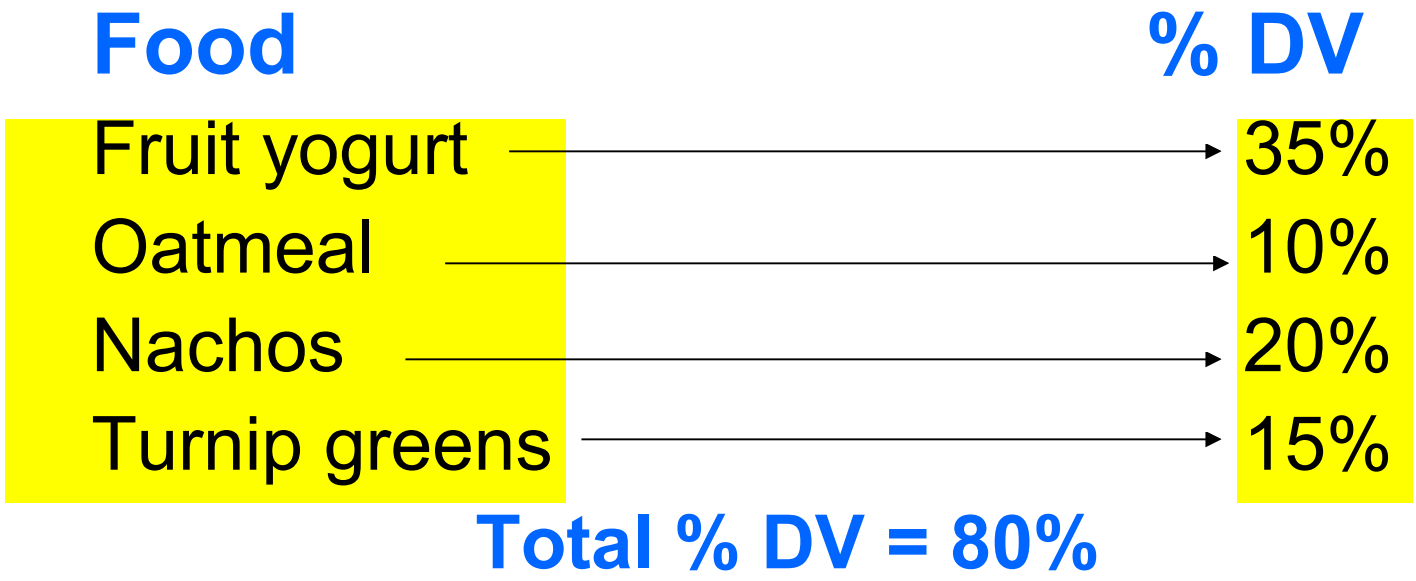
Nutrition Facts

Serving Size 1cup (228g)
Servings Per Container 2

Amount Per Serving	
Calories 250	**Calories from Fat** 110
	%Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A 4%	• Vitamin C 2%
Calcium 20%	• Iron 4%

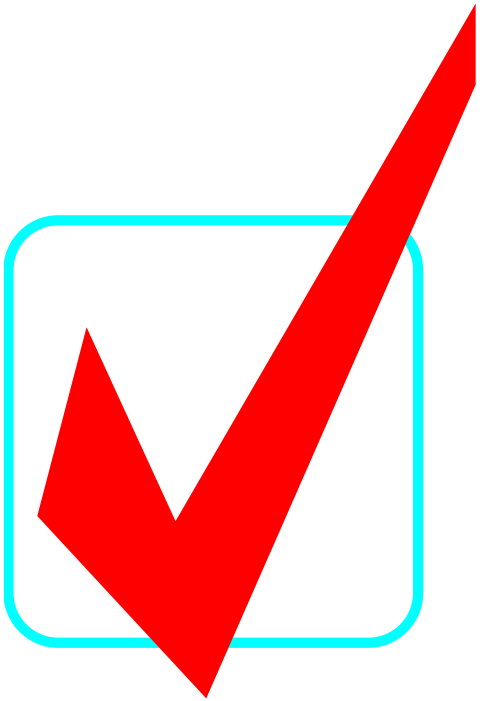
*Percent Daily Values are based on a 2,000 calorie diet.

Example: Calculating total % DV for calcium from “Nutrition Facts” labels



Source: “Calcium! Do You Get It?, ” FDA/CFSAN at http://www.cfsan.fda.gov/~dms/ca-toc.html

Recommended daily calcium & vitamin D



Calcium

Vitamin D

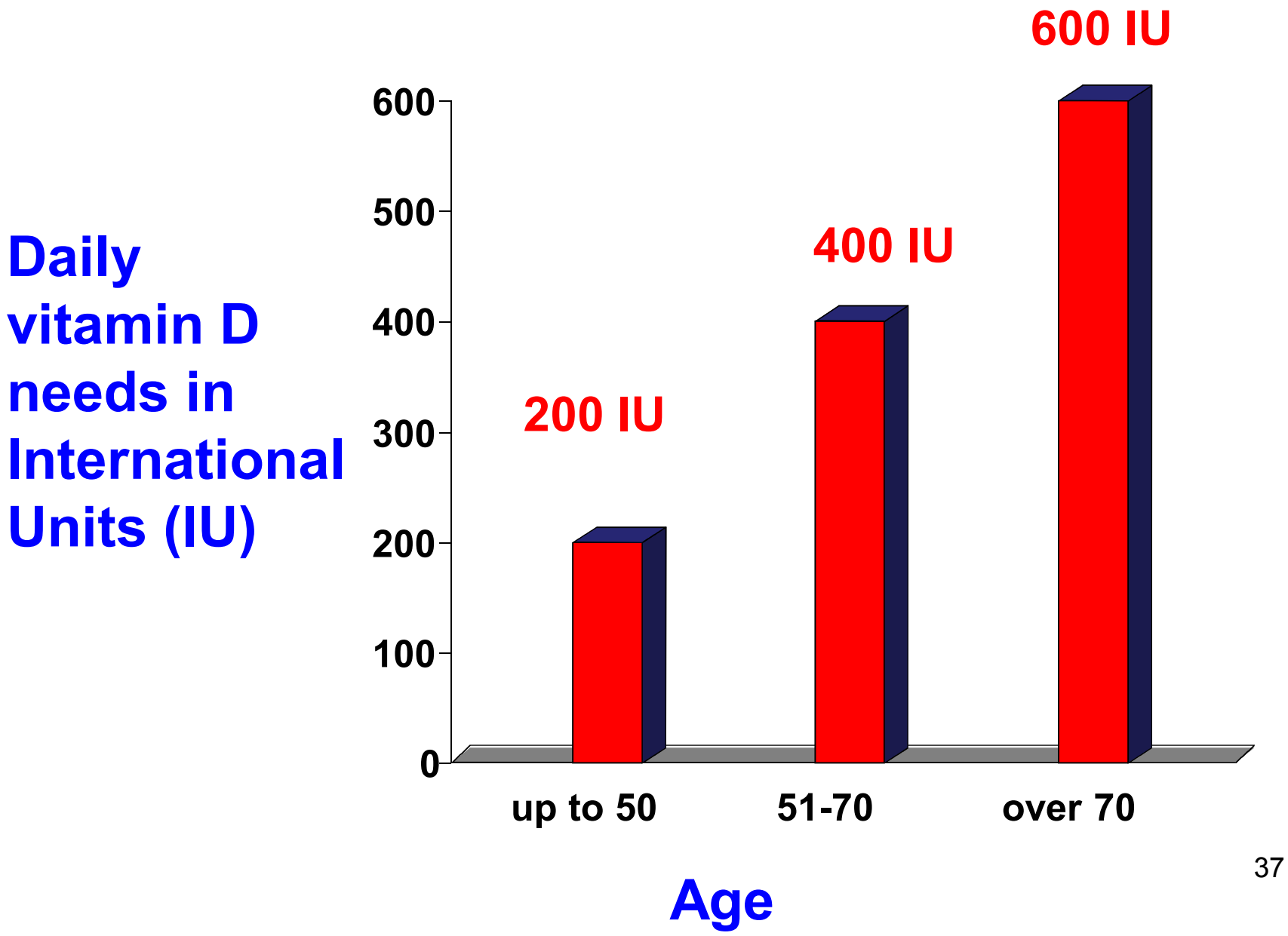
Calcium requirements vary by age

If this is your age	Then you need this much calcium each day (mg)
0 to 6 months	210
7 to 12 months	270
1 to 3 years	500
4 to 8 years	800
9 to 18 years	1,300
19 to 50 years	1,000
Over 50 years	1,200

Growth spurt

Source: The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

You need more vitamin D as you age



It's important to remember …

Some age groups need MORE or LESS than 100% DV for calcium and vitamin D.

- Calcium requirements vary by age:
  - More is needed as we grow older
  - Need is highest during rapid growth of adolescence.
- Vitamin D requirements increase as we age.
- 100% DV for calcium and Vitamin D are based on 1,000 mg calcium and 400 IU vitamin D.

Calcium & vitamin D recommendations

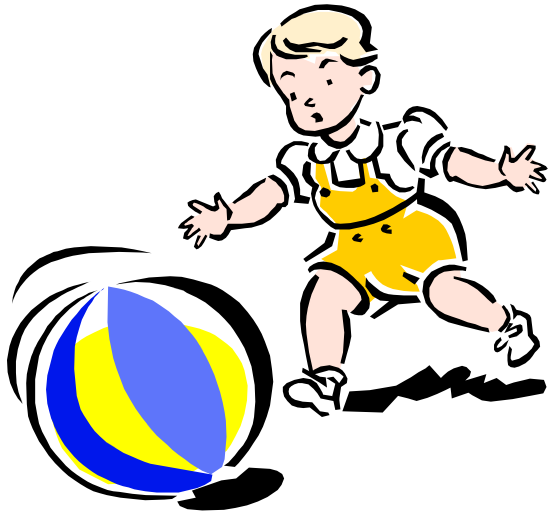
- **Birth - 6 months**
  210 mg calcium (21% DV)
  200 IU vitamin D (50% DV)

- **6 months - 1 year**
  270 mg calcium (27% DV)
  200 IU vitamin D (50% DV)

Some age groups need MORE or LESS than 100% DV for calcium and vitamin D

Calcium & vitamin D recommendations

- **1 - 3 years**
  500 mg calcium (50% DV)
  200 IU vitamin D (50% DV)



- **4 - 8 years**
  800 mg calcium (80% DV)
  200 IU vitamin D (50% DV)

Some age groups need MORE or LESS than 100% DV for calcium and vitamin D

Calcium & vitamin D recommendations

- **9 - 18 years**
  1,300 mg calcium (130% DV)
  200 IU vitamin D (50% DV)

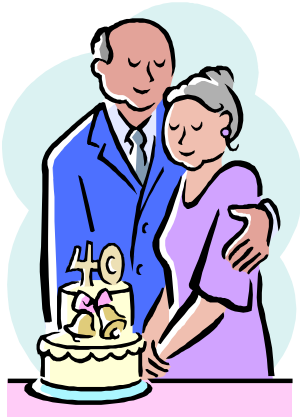
- **19 - 50 years**
  1,000 mg calcium (100% DV)
  200 IU vitamin D (50% DV)

Some age groups need MORE or LESS than 100% DV for calcium and vitamin D

Calcium & vitamin D recommendations

- **51 - 70 years**
  1,200 mg calcium (120% DV)
  400 IU vitamin D (100% DV)

- **71 and older**
  1,200 mg calcium (120% DV)
  600 IU vitamin D (150% DV)



Some age groups need MORE or LESS than 100% DV for calcium and vitamin D

Calcium & vitamin D recommendations

Pregnant & Lactating

- **14 - 18 years**
  1,300 mg calcium (130% DV)
  200 IU vitamin D (50% DV)

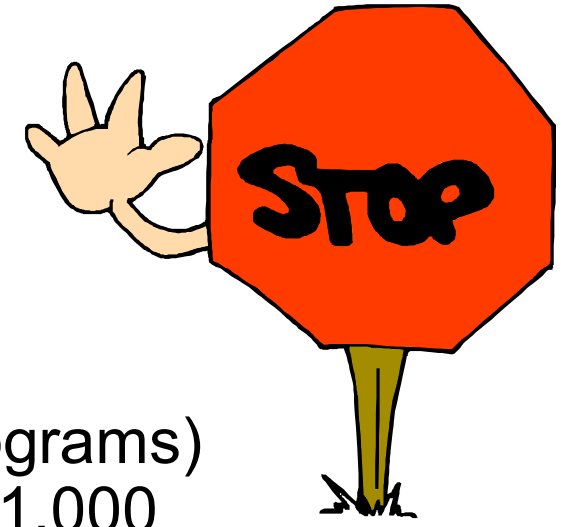
- **19 - 50 years**
  1,000 mg calcium (100% DV)
  200 IU vitamin D (50% DV)

Some age groups need MORE or LESS than 100% DV for calcium and vitamin D

Upper daily limits: calcium & vitamin D

The National Academy of Sciences (1997) suggests the following tolerable daily upper intake levels (UL) from foods and supplements combined:

- **Calcium:** The UL for 1 year and older (including pregnant and lactating women) is 2,500 mg/day. It was not possible to establish an UL for infants under age 1.



- **Vitamin D:** No higher than 50 mcg (micrograms) or 2,000 IU for ages 1 and over; 25 mcg (1,000 IU) for 0 to 12 months

The National Osteoporosis Foundation recommends limiting Vitamin D to 800 IU/day unless your doctor prescribes it.

Percent Daily Value (DV) of calcium in common foods

Approximate % DV for foods based in part on The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You at http://www.surgeongeneral.gov/library/bonehealth

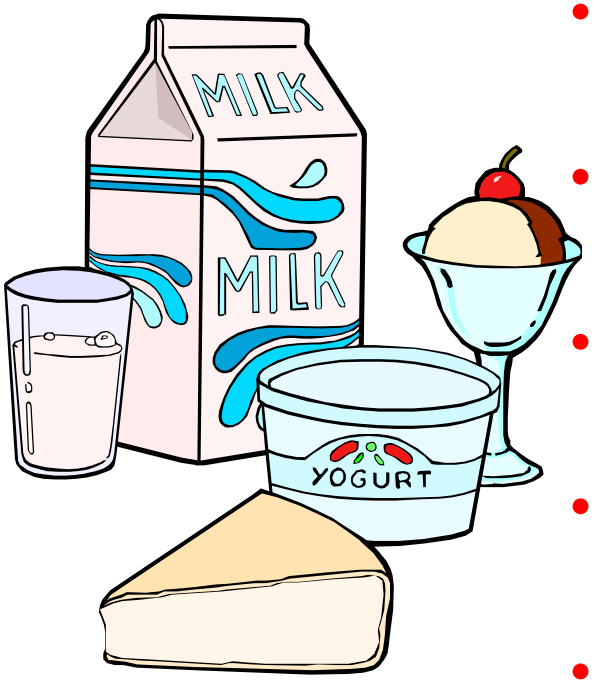
An easy way to meet calcium needs is consuming 3 cups (8 oz.) each day of fat-free or low-fat* milk or equivalent milk products in combination with a healthy diet. Children ages 2–8 years need 2 cups.

MyPyramid equivalents:

- **8 oz. milk**
- **1 cup yogurt**
- **1-1/2 oz. natural or 2 oz. processed cheese**

* Fat-free and low-fat are for health but not for calcium differences

% DV calcium: Milk group



Choose fat-free or low fat most often

- **Yogurt**
  1 cup (8 oz.) = 30% DV
- **Milk**
  1 cup = 30% DV
- **Cheese**
  1 ½ oz. natural/2 oz. processed = 30% DV
- **Milk pudding**
  1/2 cup = 15% DV
- **Frozen yogurt, vanilla, soft serve**
  ½ cup = 10% DV
- **Ice cream, vanilla**
  ½ cup = 8% DV
- **Soy or rice milk, calcium-fortified**
  1 cup = varies—check label

% DV calcium: Grain products group

- **Cereal, calcium-fortified**
  Serving size and amount of calcium varies—check label

% DV calcium: Vegetable group

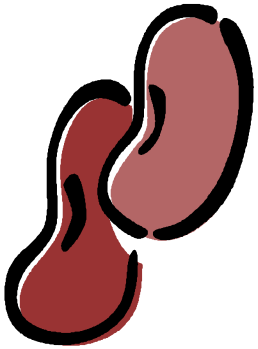
- **Broccoli, raw**
  1 cup = 9% DV
- **Collards**
  1/2 cup = 20% DV
- **Turnip greens, boiled**
  1/2 cup = 10% DV

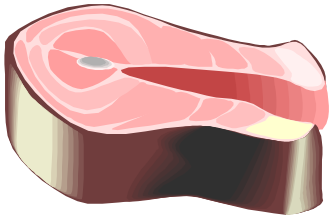
% DV calcium: Fruit group

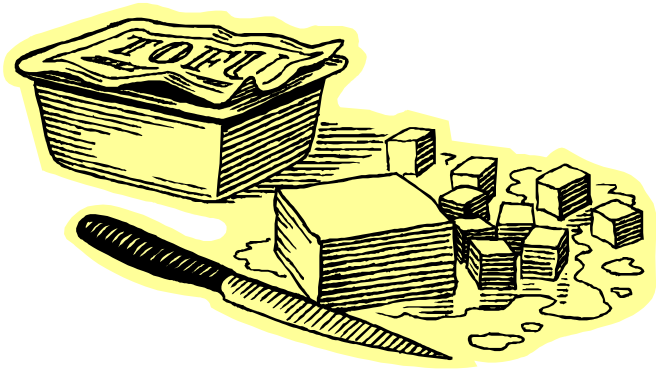
- **Orange juice and other calcium-fortified beverages**
  6 oz. = 20 to 30% DV, varies—check label

Look for 100% juice

% DV calcium: Meat & Beans Group

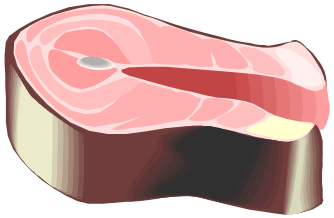






- **Baked beans**
  1 cup = 14% DV
- **Salmon, canned, with edible bones**
  3 oz. = 18% DV
- **Sardines, canned, in oil, with edible bones**
  3 oz. = 32% DV
- **Soybeans, cooked**
  1 cup = 26%
- **Tofu, firm, with calcium**
  ½ cup = 20% DV; check label

What about Vitamin D?

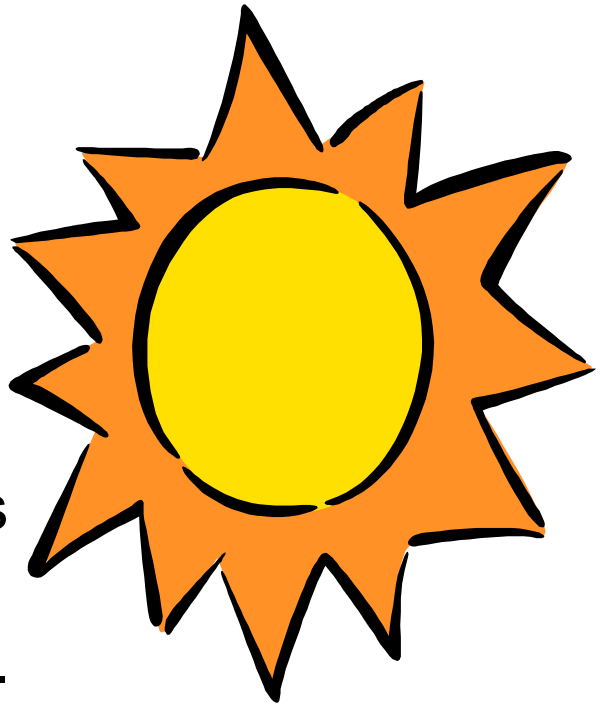


Main dietary sources of vitamin D are:

- Fortified milk
  (400 IU per quart)
- Some fortified cereals
- Cold saltwater fish
  (Example: salmon, halibut, herring, tuna, oysters and shrimp)
- Some calcium and vitamin/mineral supplements

Vitamin D from sunlight exposure

- Vitamin D is manufactured in your skin following direct exposure to sun.
- Amount varies with time of day, season, latitude and skin pigmentation.
- 10–15 minutes exposure of hands, arms and face 2–3 times/week may be sufficient (depending on skin sensitivity).
- Clothing, sunscreen, window glass and pollution reduce amount produced.



Source: National Osteoporosis Foundation Web site; retrieved July 2005 at http://www.nof.org

Additional dietary considerations

Food is the best calcium source

- There may be additional substances in foods that affect the body's absorption and use of their calcium.
- A balanced diet that promotes a healthy weight may provide additional benefits to protect against osteoporosis.

Calcium amount at one time

- Body can best handle about 500 mg calcium at one time from food and/or supplements.
- Consume calcium sources throughout day instead of all at one time.

Fiber

Excessive fiber—such as from overusing fiber supplements—could interfere with calcium absorption.

Fiber naturally present in food should not be a problem and is beneficial to health.

Excessive sodium

- Can increase urinary calcium excretion
- Food and Nutrition Board recommends limit of 2,300 mg daily
- Sodium given on “Nutrition Facts” panel on foods

Oxalic acid

Present in foods such as spinach, chard, beet greens and chocolate:

- Binds calcium in those foods
- Doesn’t seem to affect calcium in other foods, including chocolate milk
- These greens still good for you; may help calcium absorption in other ways

High protein

Unbalanced, excessively high protein diets could increase urinary excretion of calcium.

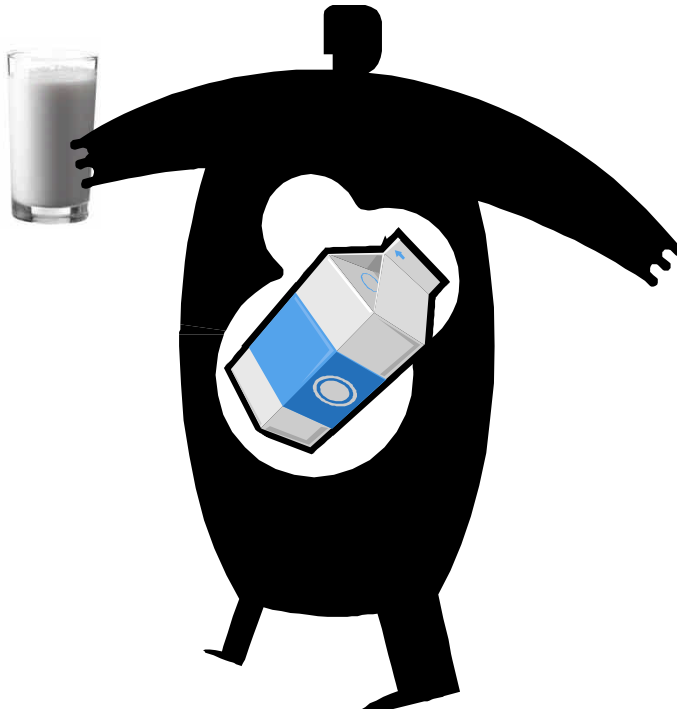
Soymilk

- Not all soymilk is calcium-fortified or contains vitamin D; check “Nutrition Facts” panel.
- 4 (8-oz.) glasses of soy milk may equal 3 (8-oz.) glasses of cow’s milk in availability of calcium.
- Part of added calcium may be left in container when drinking some soymilks.

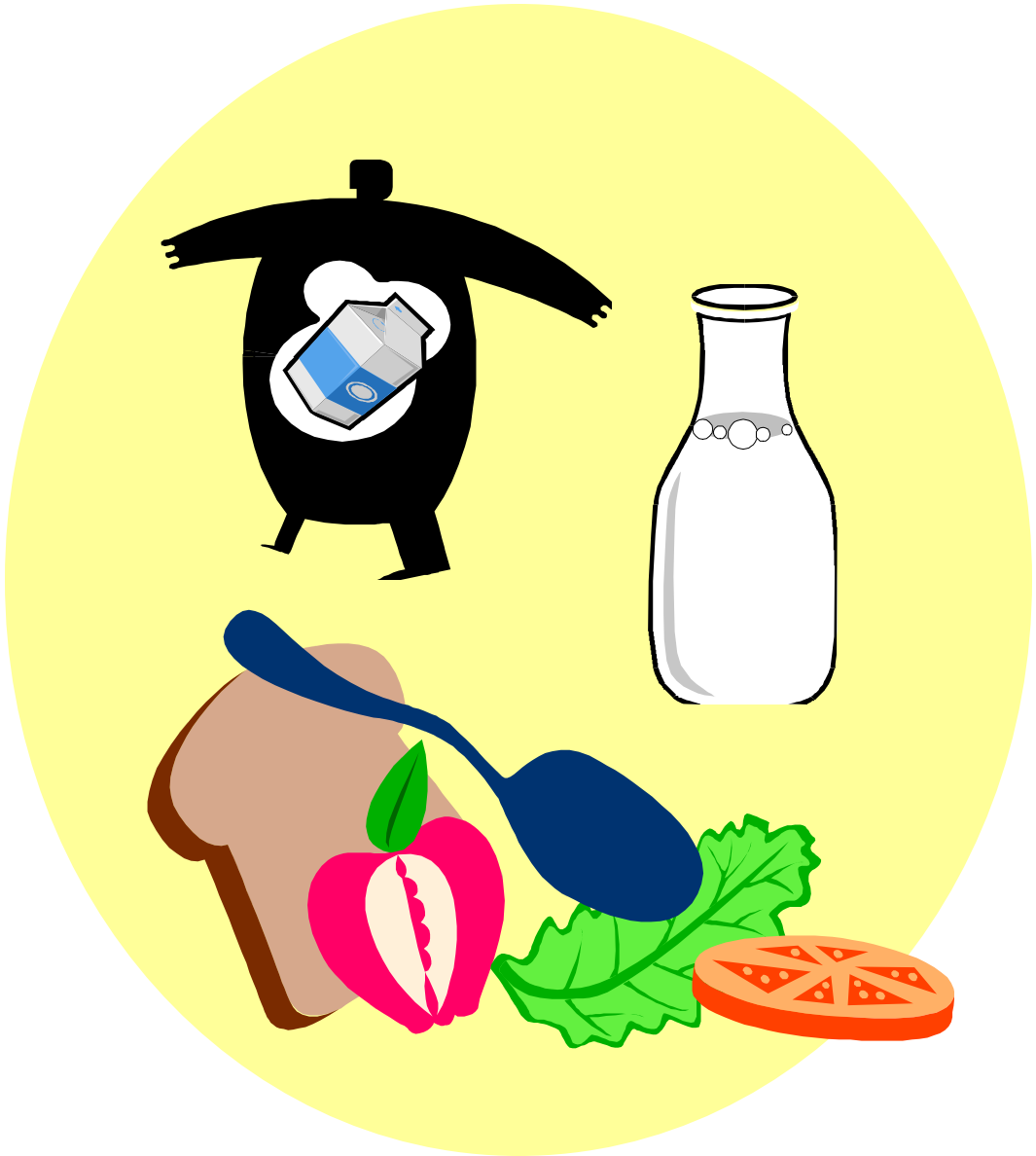
Help for the lactose-intolerant

Some people lack the enzyme lactase needed to digest lactose (milk sugar).

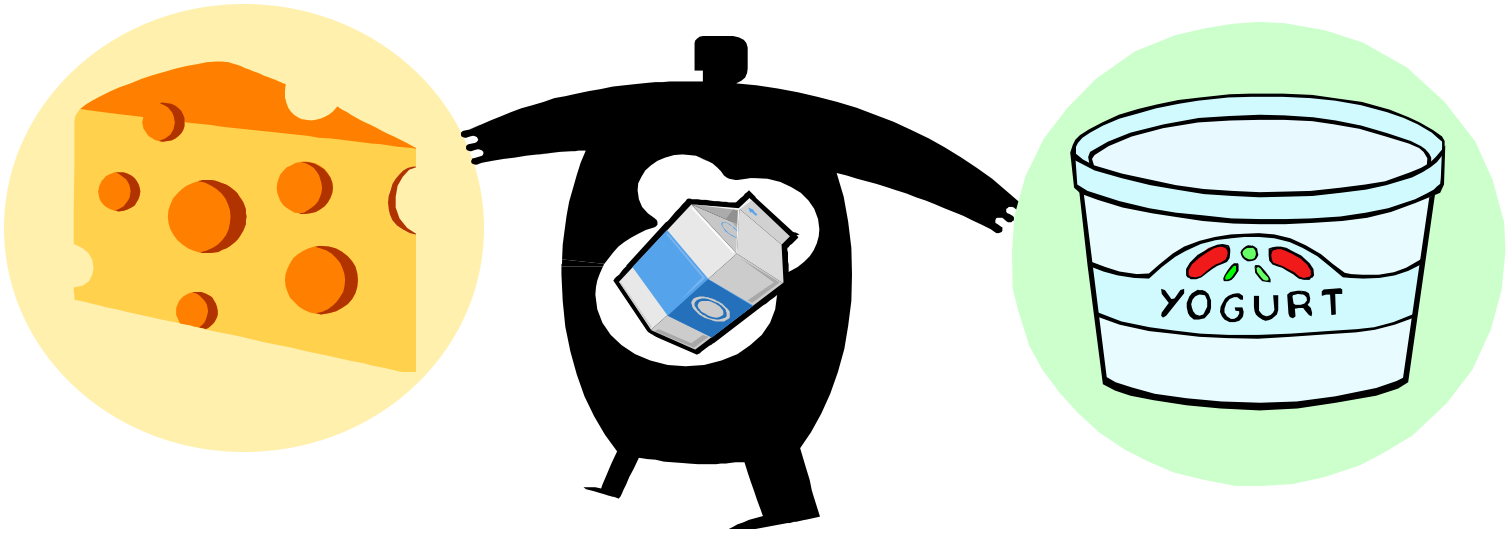
Here are some tips which may help people obtain calcium from dairy products…



Start with small portions of foods such as milk and gradually increase serving size.

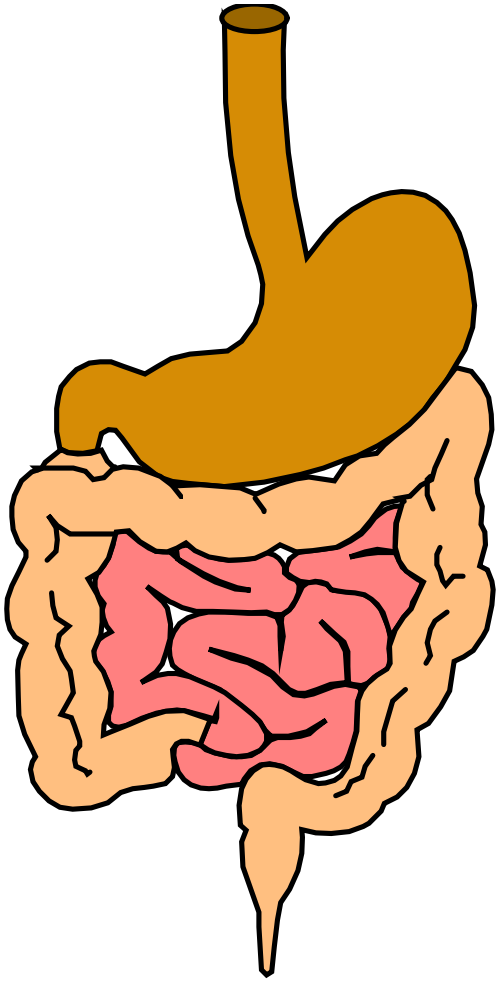


Eat dairy foods in combination with a meal or solid foods.



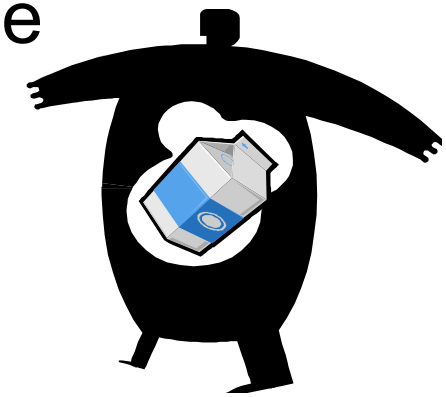
Try dairy foods other than milk:

- Many hard cheeses (cheddar, Swiss, Parmesan) have less lactose than milk
- Yogurt made with live, active bacteria

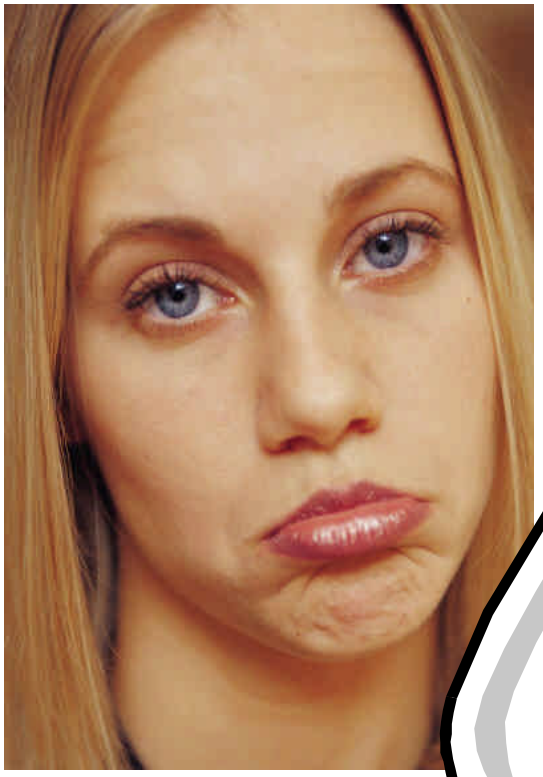


It may be easier to digest lactose that is pre-digested or broken down to its simple sugar components (glucose and galactose):

- Lactose-hydrolyzed milk and dairy products
- Commercial lactase preparations

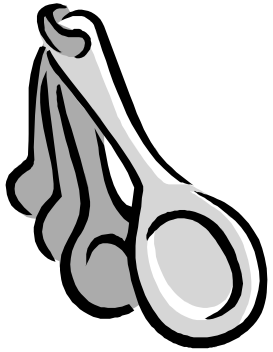


When you don’t like to “drink” milk



Make oatmeal and cream-type soups with milk instead of water

Add milk to coffee



Add powdered milk to food
(1 tablespoon = 50 mg calcium)

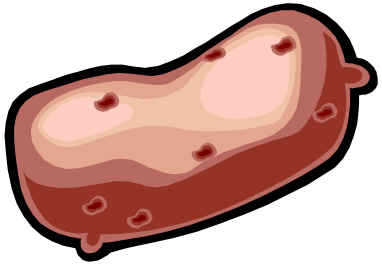
Serve milk-based desserts (puddings, tapioca, frozen yogurt, custard, ice cream). Limit fat and sugar.

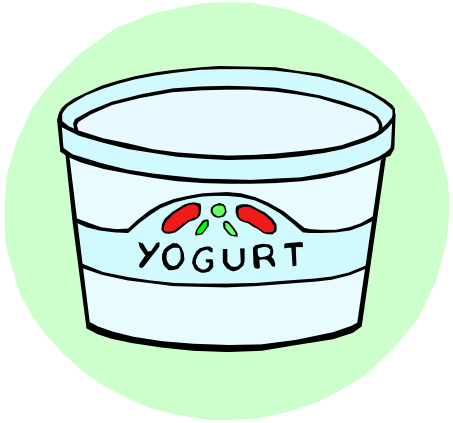
Try chocolate milk.

- 8-oz. has only 2 - 7 mg caffeine.
- Average glass provides only 60 more calories than unflavored milk.

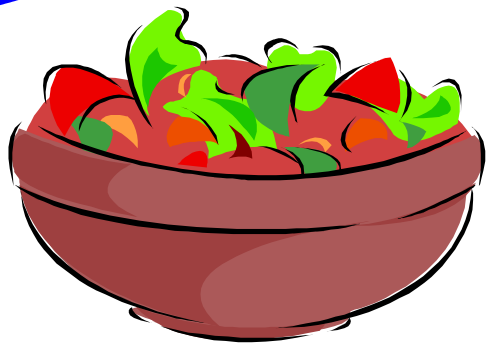
Make instant hot cocoa with milk, not water.

Top baked potatoes with plain yogurt; sprinkle with chives





Enjoy plain or flavored low fat yogurt straight from the carton or combined



Used flavored yogurt as a fruit salad dressing; experiment with substituting plain yogurt for some or all of the sour cream in vegetable salad dressings

Have It YOUR Way Smoothie
(serves 1)

- 1 cup unsweetened, frozen raspberries or frozen fruit of choice
- 1/2 cup 100% orange or pineapple juice
- 3/4 cup fruit-flavored, low- or non-fat yogurt

Blend all ingredients well in blender. Enjoy!

Use a calcium-fortified juice to add extra calcium

Fantastic Fruit Parfait

Layer yogurt, low-fat granola and fruit in whatever proportions you'd like.

Add some nuts and you've included a 4th food group. A sprig of mint is optional!

Calcium supplement considerations

Calcium carbonate vs. citrate

Calcium carbonate

- **Needs acid to dissolve and for absorption**
- **Less stomach acid as we age**
- **Often taken at meals when more stomach acid**

Calcium citrate

- **Doesn't require stomach acid for absorption**
- **May be taken anytime—check with your healthcare provider**
- **May cost more**

Vitamin D necessary for calcium absorption

Vitamin D is like a key that unlocks the door and lets calcium into the body.

- Choose a supplement with vitamin D unless obtaining vitamin D from other sources.
- Follow age group recommendation. Avoid going over a daily combined total of 2,000 IU or 50 mcg from food and supplements.
- It's not necessary to consume calcium and vitamin D at the same time to get the benefit of enhanced calcium absorption.

Limit calcium to 500 mg at a time

Our bodies can best handle about 500 mg calcium at one time from food and/or supplements.

Spread your calcium sources throughout the day.

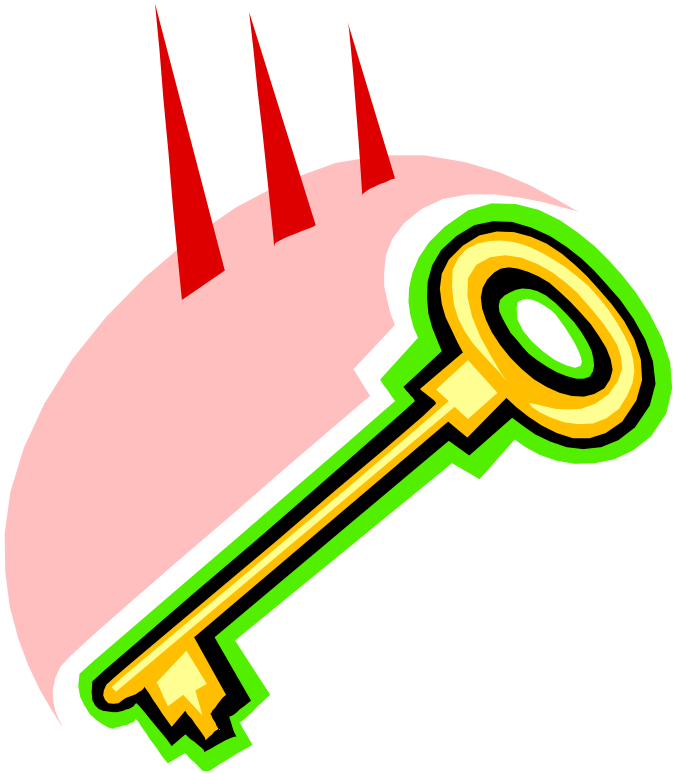
Increase amount slowly

- Start supplements with 500 mg calcium daily for about a week, gradually adding more.
- Gas and constipation can be side effects:
  - Increase fluids and high fiber foods if diet is low in whole grains and fruits and vegetables.
  - Try a different type of supplement if side effects continue.

Check for interactions

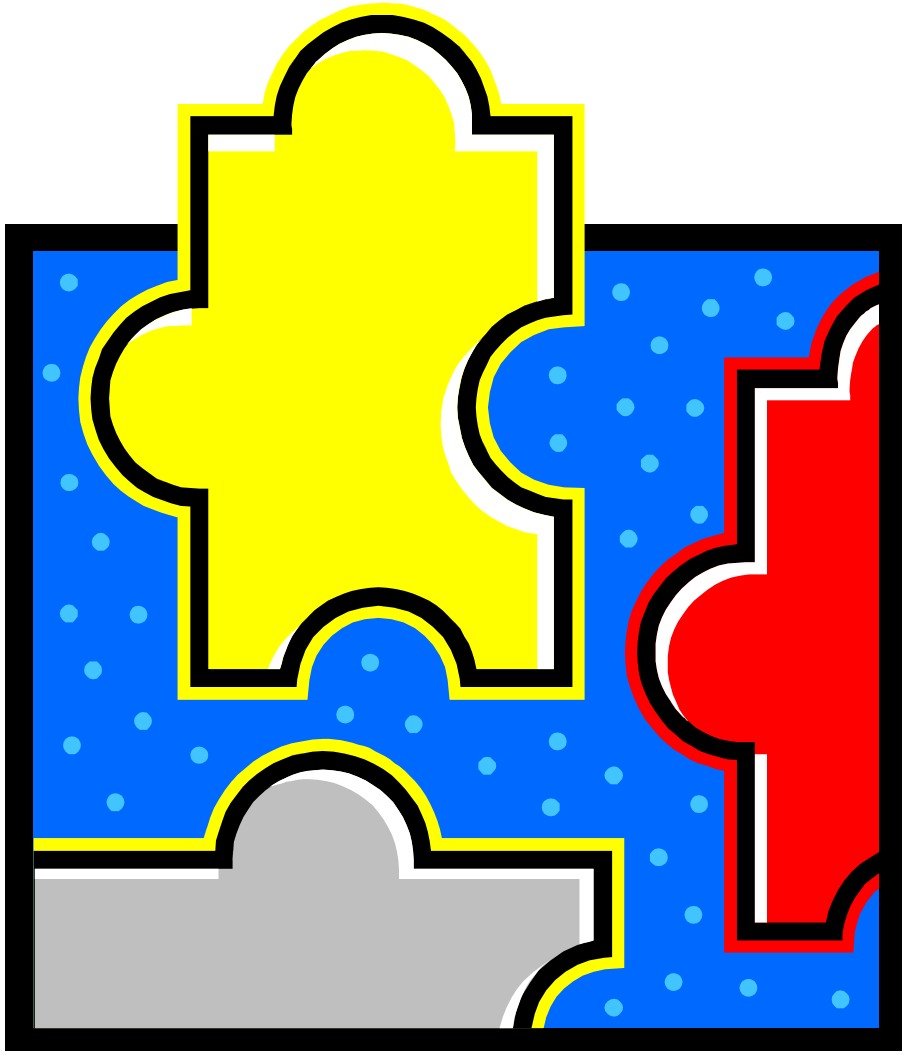
Check with physician or pharmacist for interactions with other prescriptions and over-the-counter drugs.

Food is still important



- High calcium foods contain other KEY nutrients which are important in the diet.
- Try to obtain some (or all) of your calcium from your diet, not just supplements.

Putting it all together

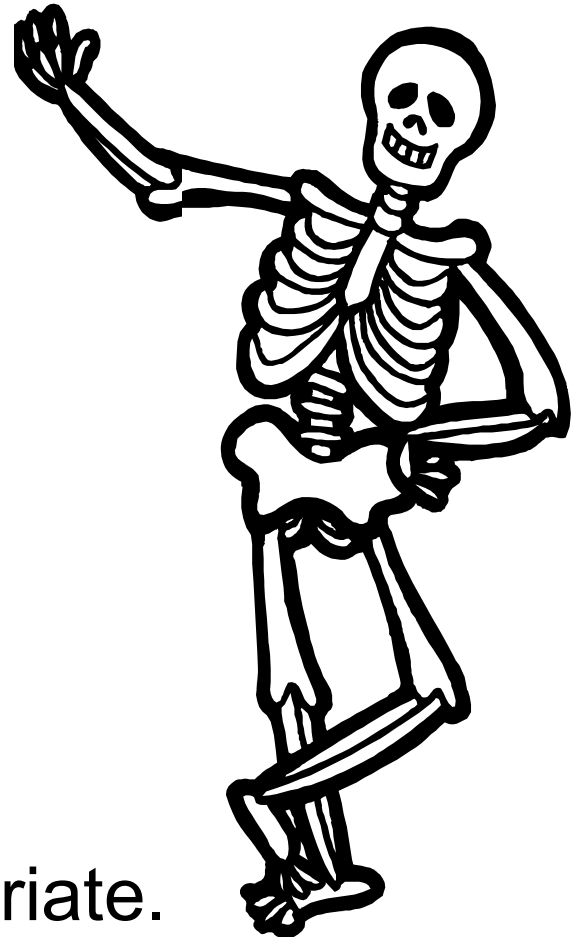


Prevention Step 1: How are you doing?

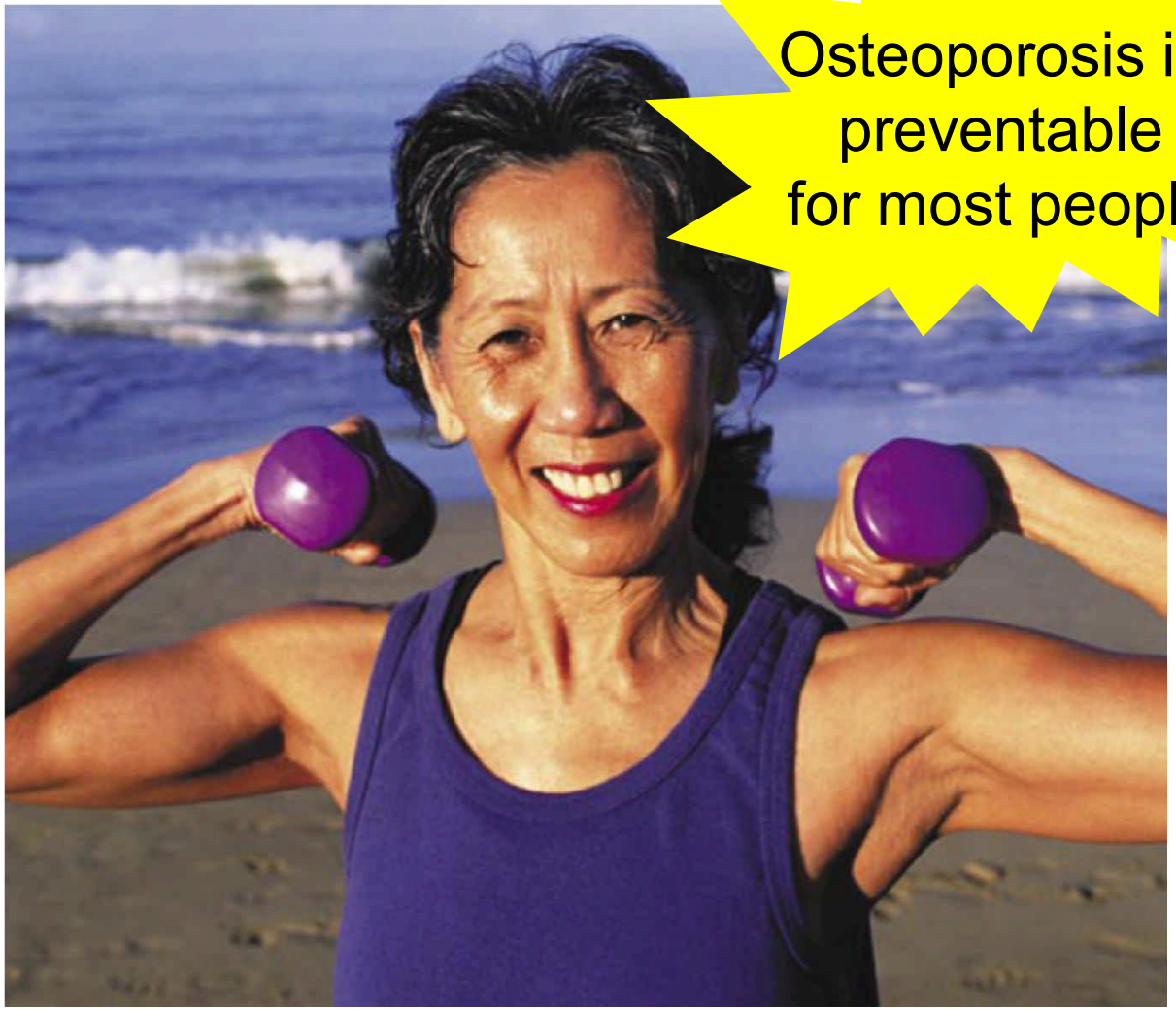
Calcium/Vitamin D foods & supplements consumed in a day	% DV Calcium	% DV Vitamin D
1 cup milk	30	25
TOTAL you consumed		
% DV recommended for your age		

Also, follow the other four prevention steps …

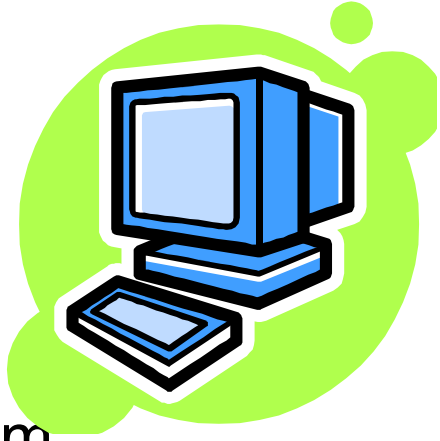
- Engage in regular weight-bearing exercise.
- Avoid smoking and excessive alcohol.
- Talk to your doctor about bone health.
- Have a bone density test and take medication when appropriate.



Live well, live strong, live long



For more information



- Kentucky Osteoporosis Program
http://chfs.ky.gov/dph/info/dpqi/cd/osteo.htm

- The 2004 Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You
http://www.surgeongeneral.gov/library/bonehealth

- National Osteoporosis Foundation http://www.nof.org

- **For data on falls specific to your Kentucky County, visit http://www.kspan.uky.edu/data.htm or www.nofalls.org**

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